AMENDMENTS TO THE CLAIMS

1. (CURRENTLY AMENDED) A multiband antenna comprising:

a multilevel structure comprising a conducting structure including a set of polygons, all of said polygons having the same number of sides, wherein said polygons are electromagnetically coupled either by means of a capacitive coupling or ohmic contact, and wherein a contact region between directly connected polygons is narrower than 50% of the perimeter of said polygons in at least 75% of said polygons defining said conducting structure;

wherein said set of polygons comprises at least eight polygons; and

wherein at least two polygons of the multilevel structure are spaced by means of a non-straight gap ~~shaped as a space-filing curve~~;

wherein the non-straight gap increases a resonant length of the multiband antenna but does not increase an overall physical size of the multiband antenna; and

wherein the overall physical size of the multiband antenna is defined by the outer dimensions of the multiband antenna.

2. (CURRENTLY AMENDED) A multiband antenna according to claim 1 wherein the non-straight gap ~~space-filling curve~~ approximates a fractal shape or curve.

3. (PREVIOUSLY PRESENTED) A multiband antenna according to claims 1 or 2, wherein the multilevel structure comprises at least eight rectangles, a first rectangle being capacitively coupled to a second rectangle, said second rectangle being connected at one tip to a first tip of a third rectangle, said third rectangle being substantially orthogonal to said second rectangle, said third rectangle being connected at a second tip to a first tip of a fourth rectangle, said fourth rectangle being substantially orthogonal to said third rectangle and substantially parallel to said second rectangle, said fourth rectangle being connected at a second tip to a first tip of a fifth rectangle, said fifth rectangle being substantially orthogonal to said fourth rectangle and substantially parallel to said third rectangle, said fifth rectangle being connected at a second tip to a first tip of a sixth rectangle, said sixth rectangle being substantially orthogonal to said fifth rectangle and substantially parallel to said fourth rectangle, said sixth rectangle being connected at a second tip to a first tip of a seventh rectangle, said seventh rectangle being substantially orthogonal to said sixth rectangle and parallel to said fifth rectangle, said seventh rectangle being connected to a first tip of an eighth rectangle, said eighth rectangle being substantially orthogonal to said seventh rectangle and substantially parallel to said sixth rectangle.

4. (PREVIOUSLY PRESENTED) A multiband antenna according to claims 1 or 2, wherein the multilevel structure comprises at least eight rectangles, a first rectangle being capacitively coupled to a second rectangle, said second rectangle being connected at one tip to a first tip of a third rectangle, said third rectangle being substantially orthogonal to said second rectangle, said third rectangle being connected at a second tip to a first tip of a fourth rectangle, said fourth rectangle being substantially orthogonal to said third rectangle and substantially parallel to said second rectangle, said fourth rectangle being connected at a second tip to a first tip of a fifth rectangle, said fifth rectangle being substantially orthogonal to said fourth rectangle and substantially parallel to said third rectangle, said fifth rectangle being connected at a second tip to a first tip of a sixth rectangle, said sixth rectangle being substantially orthogonal to said fifth rectangle and substantially parallel to said fourth rectangle, said sixth rectangle being

connected at a second tip to a first tip of a seventh rectangle, said seventh rectangle being substantially orthogonal to said sixth rectangle and parallel to said fifth rectangle, said seventh rectangle being connected to a first tip of an eight rectangle, said eighth rectangle being substantially orthogonal to said seventh rectangle and substantially parallel to said sixth rectangle, and wherein said eight eighth rectangle is placed between said fourth and sixth rectangles.

5-9. (CANCELED)

10. (PREVIOUSLY PRESENTED) A multiband antenna according to claim 1, wherein the multiband antenna operates at five bands, and wherein the multilevel structure is placed at one end of a rectangular ground-plane and substantially parallel to said ground-plane.

11. (PREVIOUSLY PRESENTED) A multiband antenna according to claim 1, wherein the multiband antenna operates at five bands, and wherein the antenna is fed by means of a straight pin to a point on the second or third rectangle of said multilevel structure and wherein the antenna is matched below a VSWR<3 at the frequency bands of at least one of the following five wireless services: GSM900, GSM1800, PCS1900, UMTS and 2.4GHz.

12. (PREVIOUSLY PRESENTED) A multiband antenna according to claim 1, wherein the multiband antenna operates at five bands, and wherein the multilevel structure is placed over a Multilevel and Space-Filling Ground-Plane which includes at least two conducting surfaces, said conducting surfaces being connected by at least a conducting strip, said strip being narrower than the width of any of said two conducting surfaces.

13. (PREVIOUSLY PRESENTED) A multiband antenna according to claim 1, wherein the multiband antenna operates at five bands, and wherein the multilevel structure is placed over a rectangular ground-plane, said ground-plane including at least one slot in at least one of its edges.

14. (PREVIOUSLY PRESENTED) A multiband antenna according to claim 1, wherein the multiband antenna operates at five bands, and wherein the antenna is placed inside a cellular phone or handheld wireless terminal.

15. (PREVIOUSLY PRESENTED) A multiband antenna according to claim 4, wherein the multiband antenna operates at five bands, and wherein the non-straight gap is placed between said second and fourth rectangle.

16. (CURRENTLY AMENDED) A multiband antenna configured to operate at five bands, the multiband antenna comprising:

a multilevel structure comprising a conducting structure including a set of polygons, all of said polygons having the same number of sides, wherein said polygons are electromagnetically coupled either by means of a capacitive coupling or ohmic contact, and wherein a contact region between directly connected polygons is narrower than 50% of the perimeter of said polygons in at least 75% of said polygons defining said conducting structure;

wherein said set of polygons comprises at least eight polygons; and

wherein at least two polygons of the multilevel structure are spaced by means of a non-straight gap ~~shaped as a space-filling curve~~ and at least two polygons of the multilevel structure are quadrangles;

wherein the non-straight gap increases a resonant length of the multiband antenna but does not increase an overall physical size of the multiband antenna; and

wherein the overall physical size of the multiband antenna is defined by the outer dimensions of the multiband antenna.

17. (PREVIOUSLY PRESENTED) A multiband antenna according to claim 16, wherein the multilevel structure comprises at least eight rectangles, a first rectangle being capacitively coupled to a second rectangle, said second rectangle being connected at one tip to a first tip of a third rectangle, said third rectangle being substantially orthogonal to said second rectangle, said third rectangle being connected at a second tip to a first tip of a fourth rectangle, said fourth rectangle being substantially orthogonal to said third rectangle and substantially parallel to said second rectangle, said fourth rectangle being connected at a second tip to a first tip of a fifth rectangle, said fifth rectangle being substantially orthogonal to said fourth rectangle and substantially parallel to said third rectangle, said fifth rectangle being connected at a second tip to a first tip of a sixth rectangle, said sixth rectangle being substantially orthogonal to said fifth rectangle and substantially parallel to said fourth rectangle, said sixth rectangle being connected at a second tip to a first tip of a seventh rectangle, said seventh rectangle being substantially orthogonal to said sixth rectangle and parallel to said fifth rectangle, said seventh rectangle being connected to a first tip of an eighth rectangle, said eighth rectangle being substantially orthogonal to said seventh rectangle and substantially parallel to said sixth rectangle.

18. (PREVIOUSLY PRESENTED) A multiband antenna according to claim 17, wherein the non-straight gap is placed between said second and fourth rectangle.

19. (PREVIOUSLY PRESENTED) A multiband antenna according to claim 16, wherein the multiband antenna includes at least a first short-circuit and a second short-circuit between the multilevel structure and the ground-plane, a first short-circuit being connected to one edge on the tip of a first polygon of said multilevel structure and a second short-circuit being connected at one edge of a second polygon of said multilevel structure.

20. (PREVIOUSLY PRESENTED) A multiband antenna according to claim 16, wherein the multiband antenna includes at least a first and a second capacitive load on the multilevel structure, said capacitive load including a conducting strip, said conducting strip being connected at one edge of said multilevel structure and being placed orthogonally to said multilevel structure between the multilevel structure and a ground-plane.

21. (PREVIOUSLY PRESENTED) A multiband antenna according to claim 20, wherein the multiband antenna includes at least a first capacitive load connected a tip of one of the polygons of the multiband antenna.

22. (PREVIOUSLY PRESENTED) A multiband antenna according to 20, wherein the multiband antenna includes at least three capacitive loads, a first capacitive load being connected at one edge of a first polygon of said multilevel structure, and a second and a third capacitive load being connected at one edge of a second polygon of said multilevel structure.

23. (CURRENTLY AMENDED) An antenna, comprising:

a first conducting portion;

a second conducting portion electromagnetically coupled to the first conducting portion;

the first and second conducting portions defining a non-straight gap therebetween;

wherein the non-straight gap increases a resonant length of the antenna, but does not increase the outer dimensions of the antenna; and

a multilevel structure comprising at least eight polygons, the multilevel structure comprising a conducting structure including a set of polygons, all of said polygons having the same number of sides, wherein said polygons are electromagnetically coupled either by means of a capacitive coupling or ohmic contact, and wherein a contact region between directly connected polygons is narrower than 50% of the perimeter of said polygons in at least 75% of said polygons defining said conducting structure .

24. (PREVIOUSLY PRESENTED) The antenna of claim 23, wherein the non-straight gap defines a space-filling curve.

25. (PREVIOUSLY PRESENTED) The antenna of claim 23, wherein the non-straight gap defines a meandering curve.

26. (PREVIOUSLY PRESENTED) The antenna of claim 23, wherein the non-straight gap defines a periodic curve.

27. (PREVIOUSLY PRESENTED) The antenna of claim 23, wherein the non-straight gap defines a branching structure having a main gap segment and at least one minor gap segment that extends from the main gap segment.

28. (PREVIOUSLY PRESENTED) The antenna of claim 23, wherein the non-straight gap defines a curve having between two and nine segments.

29. (PREVIOUSLY PRESENTED) The antenna of claim 23, wherein the first and second conducting portions are electromagnetically coupled by means of capacitive coupling.

30. (PREVIOUSLY PRESENTED) The antenna of claim 23, wherein the first and second conducting portions are electromagnetically coupled by means of ohmic contact.

31. (PREVIOUSLY PRESENTED) The antenna of claim 24, wherein the space-filling curve approximates a fractal shape or curve.

32. (PREVIOUSLY PRESENTED) The antenna of claim 23, wherein the antenna operates at five bands, and wherein the antenna comprises a multilevel structure placed at one end of a rectangular ground-plane and substantially parallel to said ground-plane.

33. (PREVIOUSLY PRESENTED) The antenna of claim 23, wherein the antenna operates at five bands, and wherein the antenna comprises a multilevel structure placed over a Multilevel and Space-Filling Ground-Plane including the two conducting portions, said conducting portions being connected by at least a conducting strip, said strip being narrower than the width of any of said two conducting portions.

34. (PREVIOUSLY PRESENTED) The antenna of claim 23, wherein the antenna operates at five bands, and wherein the antenna comprises a multilevel structure placed over a rectangular ground-plane, said ground-plane including at least one slot in at least one of its edges.

35. (PREVIOUSLY PRESENTED) The antenna of claim 23, wherein the multiband antenna operates at five bands, and wherein the antenna is placed inside a cellular phone or handheld wireless terminal.

36. (PREVIOUSLY PRESENTED) The antenna of claim 23, wherein the second conducting portion is shorter than the first conducting portion.

37. (PREVIOUSLY PRESENTED) The antenna of claim 23, wherein a width of the non-straight gap is non-constant.

38. (PREVIOUSLY PRESENTED) The antenna of claim 23, wherein the antenna comprises a multilevel structure comprising at least eight rectangles.

39. (PREVIOUSLY PRESENTED) The antenna of claim 23, wherein the antenna comprises a multilevel structure and includes at least a first and a second capacitive load on the multilevel structure, said capacitive load including a conducting strip, said conducting strip being connected at one edge of said multilevel structure and being placed orthogonally to said multilevel structure between the multilevel structure and a ground-plane.

40. (PREVIOUSLY PRESENTED) The antenna of claim 23, wherein the antenna operates in at least three frequency bands.

41. (PREVIOUSLY PRESENTED) The antenna of claim 23, wherein the antenna operates in at least four frequency bands.

42. (PREVIOUSLY PRESENTED) The antenna of claim 23, wherein the antenna can operate simultaneously in five frequency bands.

43. (PREVIOUSLY PRESENTED) The antenna of claim 23, wherein the antenna can operate in at least two of the following frequency bands: GSM900, GSM 1800, PCS 1900, UMTS and 2.4GHz.

44. (PREVIOUSLY PRESENTED) The antenna of claim 23, wherein the antenna comprises a multilevel structure and includes at least a first capacitive load on the multilevel structure.

45. (PREVIOUSLY PRESENTED) The antenna of claim 44, wherein the antenna comprising the multilevel structure further includes a second capacitive load on the multilevel structure.

46. (PREVIOUSLY PRESENTED) The antenna of claim 44, wherein said capacitive load includes a conducting strip, said conducting strip being connected at one edge of said

multilevel structure and being placed orthogonally to said multilevel structure between the multilevel structure and a ground-plane.

47. (CANCELED)

48. (PREVIOUSLY PRESENTED) The multiband antenna according to claim 1, wherein the multilevel structure is composed by at least eight polygons.

49. (PREVIOUSLY PRESENTED) The multiband antenna according to claim 1, wherein the multiband antenna includes at least a first capacitive load on the multilevel structure.

50. (PREVIOUSLY PRESENTED) The multiband antenna according to claim 1, wherein at least a first polygon of said multilevel structure is capacitively coupled to a second polygon of said multilevel structure.

51. (NEW) The multiband antenna according to claim 1, wherein the non-straight gap is shaped as a space-filling curve.

52. (NEW) The multiband antenna according to claim 51, wherein the space-filling curve is composed of at least ten segments which are connected in such a way that each segment forms an angle with adjacent segments so that no pair of adjacent segments defines a larger straight segment, and

wherein, if the space-filling curve is periodic along a fixed straight direction of space, the corresponding period is defined by a non-periodic curve composed of at least ten connected segments of which no pair of adjacent ones of the connected segments defines a straight longer segment, and

wherein the space-filling curve does not intersect with itself at any point or intersects with itself only at an initial and final point of the space-filling curve, and

wherein the segments of the space-filling curve are shorter than a tenth of the free-space operating wavelength of the antenna.

53. (NEW) The multiband antenna according to claim 16, wherein the non-straight gap is shaped as a space-filling curve.

54. (NEW) The multiband antenna according to claim 53, wherein the space-filling curve is composed of at least ten segments which are connected in such a way that each segment forms an angle with adjacent segments so that no pair of adjacent segments defines a larger straight segment, and

wherein, if the space-filling curve is periodic along a fixed straight direction of space, the corresponding period is defined by a non-periodic curve composed of at least ten connected segments of which no pair of adjacent ones of the connected segments defines a straight longer segment, and

wherein the space-filling curve does not intersect with itself at any point or intersects with itself only at an initial and final point of the space-filling curve, and

wherein the segments of the space-filling curve are shorter than a tenth of the free-space operating wavelength of the antenna.

55. (NEW) The multiband antenna according to claim 24, wherein the space-filling curve is composed of at least ten segments which are connected in such a way that each segment forms an angle with adjacent segments so that no pair of adjacent segments defines a larger straight segment, and

wherein, if the space-filling curve is periodic along a fixed straight direction of space, the corresponding period is defined by a non-periodic curve composed of at least ten connected segments of which no pair of adjacent ones of the connected segments defines a straight longer segment, and

wherein the space-filling curve does not intersect with itself at any point or intersects with itself only at an initial and final point of the space-filling curve, and

wherein the segments of the space-filling curve are shorter than a tenth of the free-space operating wavelength of the antenna.